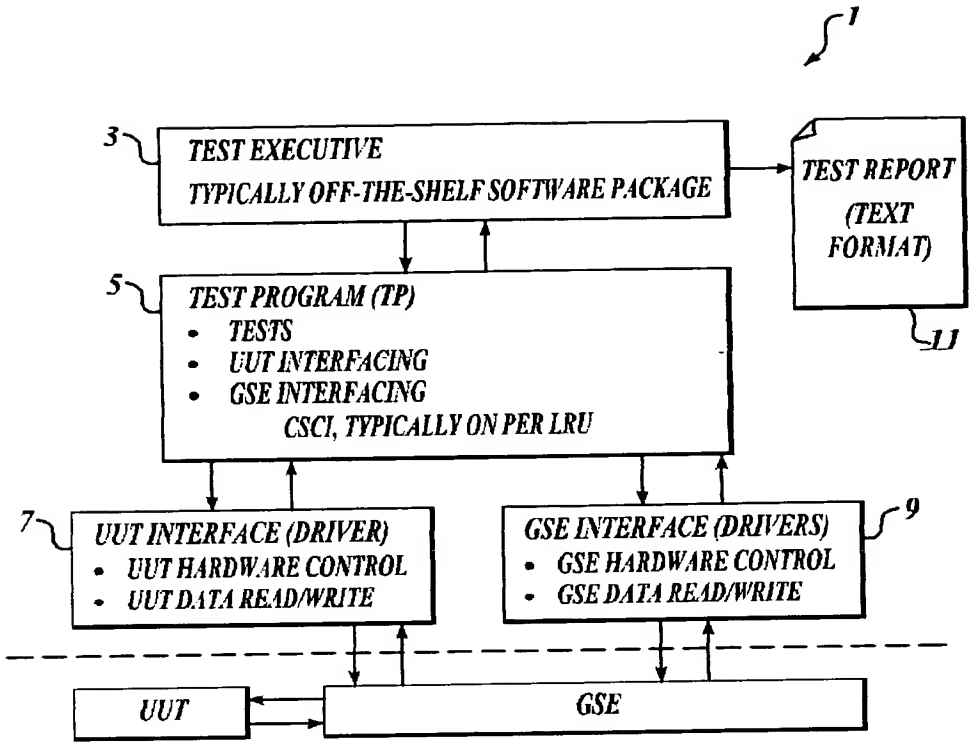


Fig. 1.
(PRIOR ART)

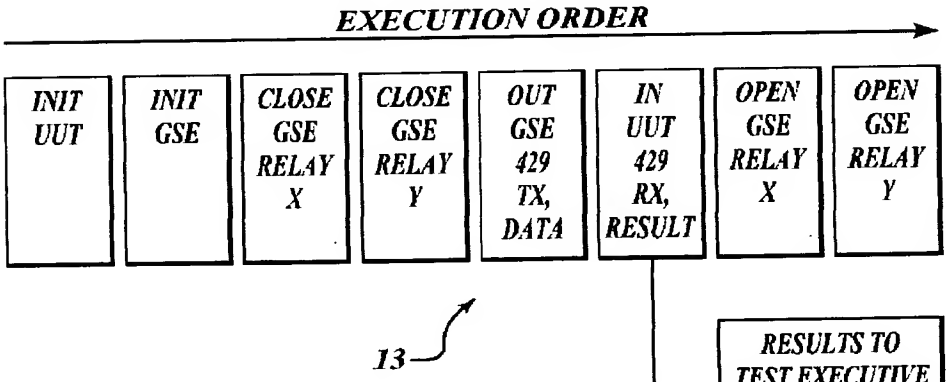


Fig. 2.
(PRIOR ART)

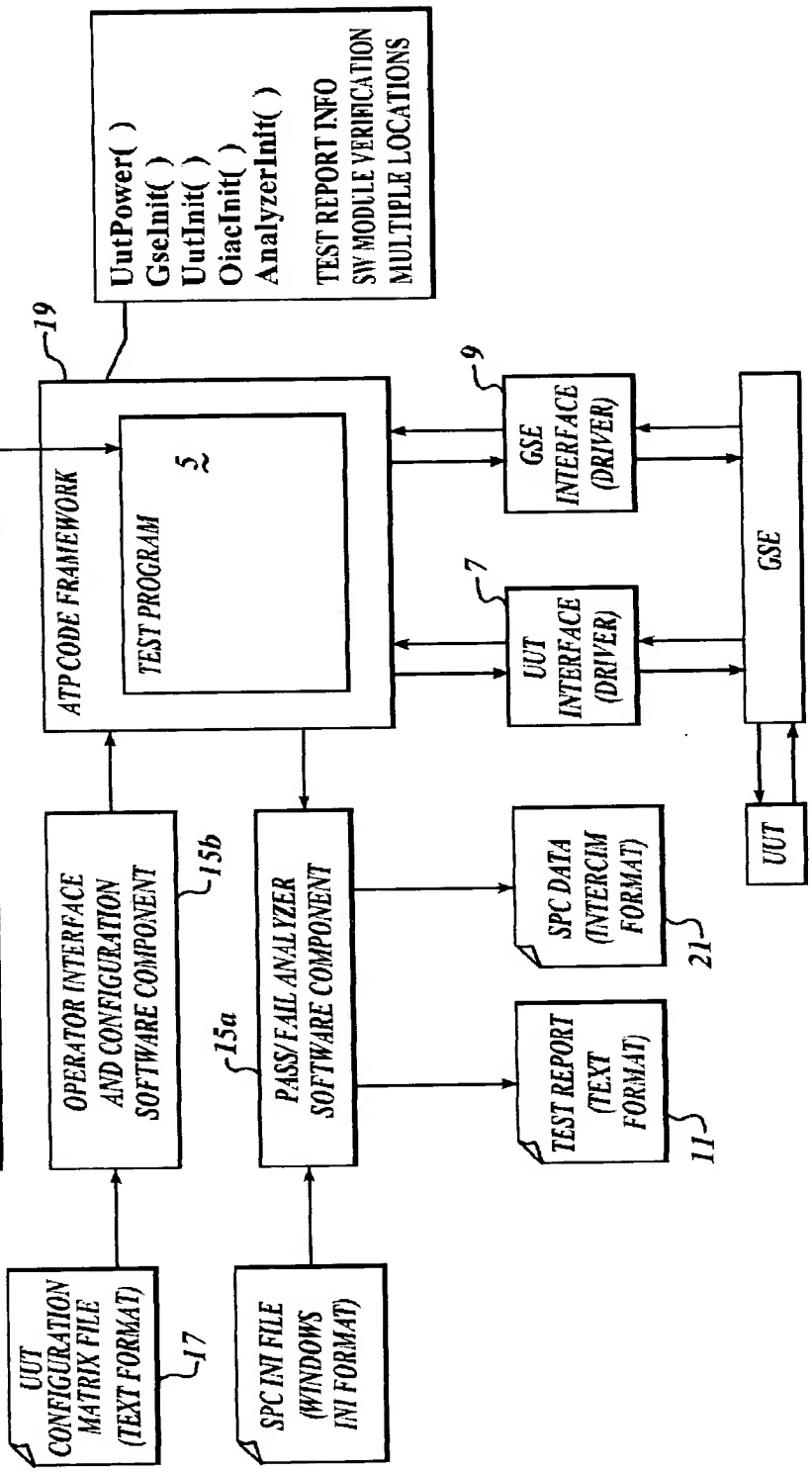


Fig. 3.
(PRIOR ART)

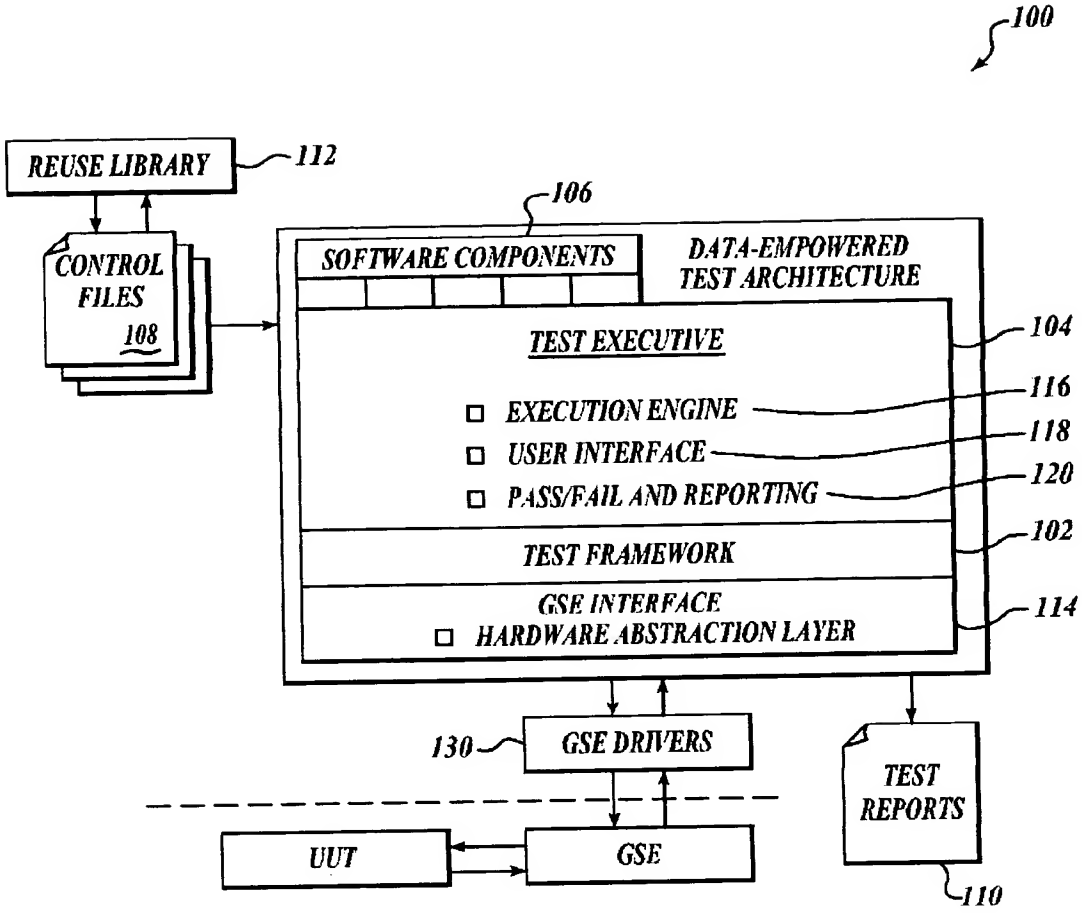

100
REUSE LIBRARY
112
CONTROL FILES
108
106
SOFTWARE COMPONENTS
DATA-EMPOWERED TEST ARCHITECTURE
TEST EXECUTIVE
104
EXECUTION ENGINE
116
USER INTERFACE
118
PASS/FAIL AND REPORTING
120
TEST FRAMEWORK
102
GSE INTERFACE
HARDWARE ABSTRACTION LAYER
114
130
GSE DRIVERS
TEST REPORTS
UUT
GSE
110

Fig. 4.

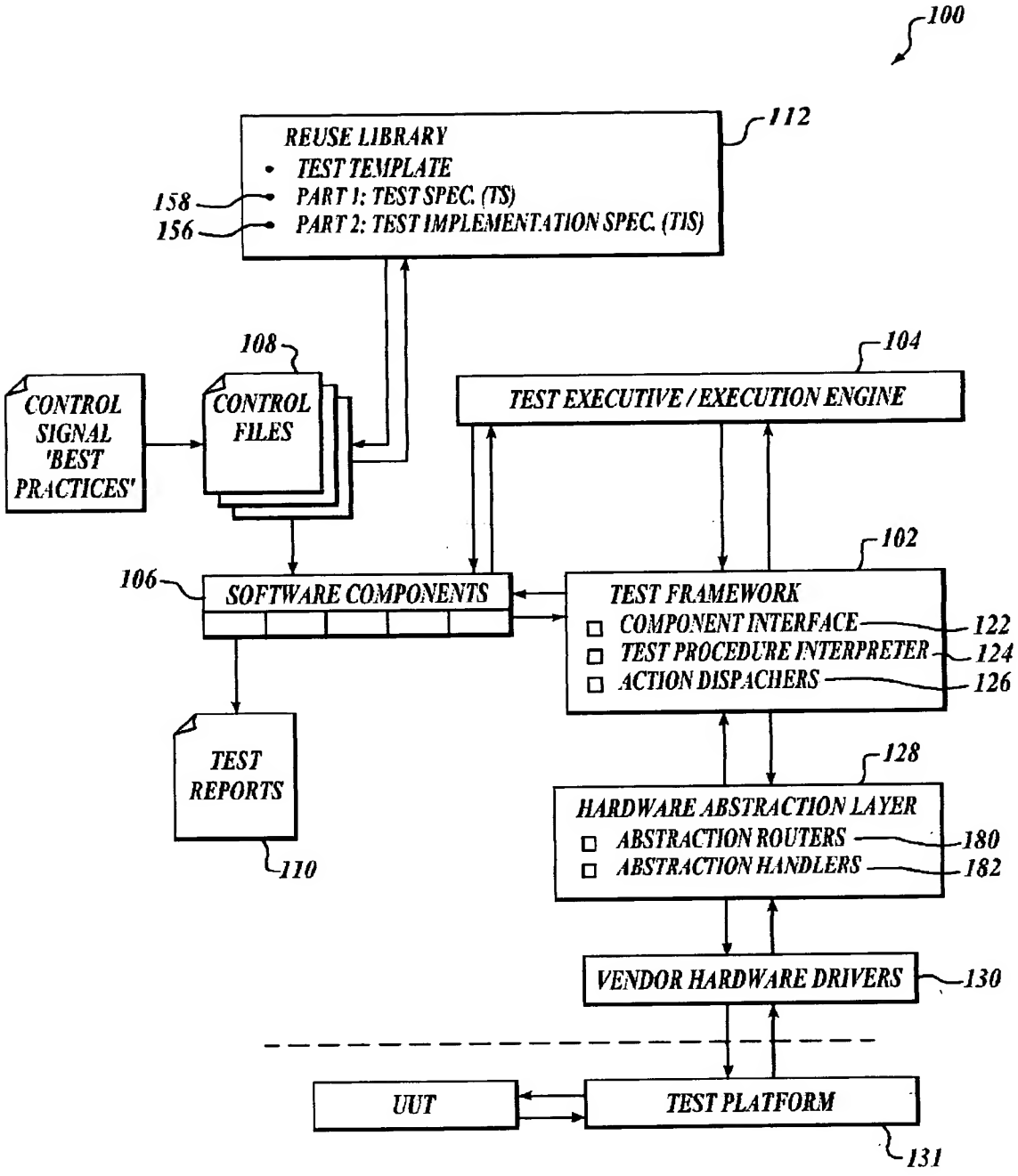

100
REUSE LIBRARY
TEST TEMPLATE
PART 1: TEST SPEC. (TS)
PART 2: TEST IMPLEMENTATION SPEC. (TIS)
112
158
156
108
CONTROL SIGNAL 'BEST PRACTICES'
CONTROL FILES
104
TEST EXECUTIVE / EXECUTION ENGINE
102
106
SOFTWARE COMPONENTS
TEST FRAMEWORK
COMPONENT INTERFACE
TEST PROCEDURE INTERPRETER
ACTION DISPACHERS
122
124
126
TEST REPORTS
110
128
HARDWARE ABSTRACTION LAYER
ABSTRACTION ROUTERS
ABSTRACTION HANDLERS
180
182
VENDOR HARDWARE DRIVERS
130
UUT
TEST PLATFORM
131

Fig. 5.

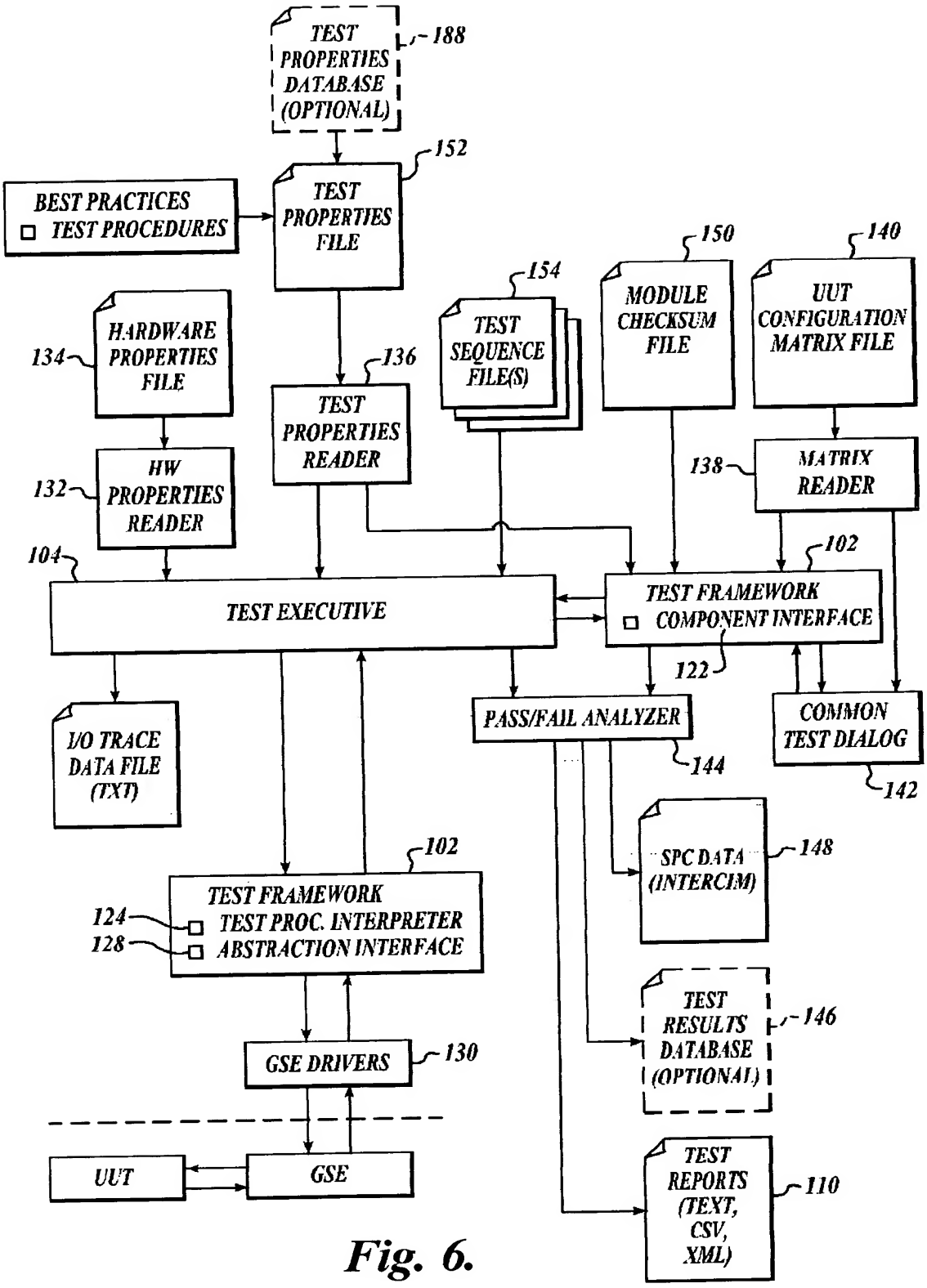

TEST PROPERTIES DATABASE (OPTIONAL)
188
BEST PRACTICES
TEST PROCEDURES
TEST PROPERTIES FILE
152
HARDWARE PROPERTIES FILE
134
HW PROPERTIES READER
132
TEST PROPERTIES READER
136
TEST SEQUENCE FILE(S)
154
MODULE CHECKSUM FILE
150
UUT CONFIGURATION MATRIX FILE
140
MATRIX READER
138
104
TEST EXECUTIVE
102
TEST FRAMEWORK
COMPONENT INTERFACE
122
I/O TRACE DATA FILE (TXT)
PASS/FAIL ANALYZER
144
COMMON TEST DIALOG
142
SPC DATA (INTERCIM)
148
102
TEST FRAMEWORK
124
TEST PROC. INTERPRETER
128
ABSTRACTION INTERFACE
TEST RESULTS DATABASE (OPTIONAL)
146
GSE DRIVERS
130
UUT
GSE
TEST REPORTS (TEXT, CSV, XML)
110

Fig. 6.

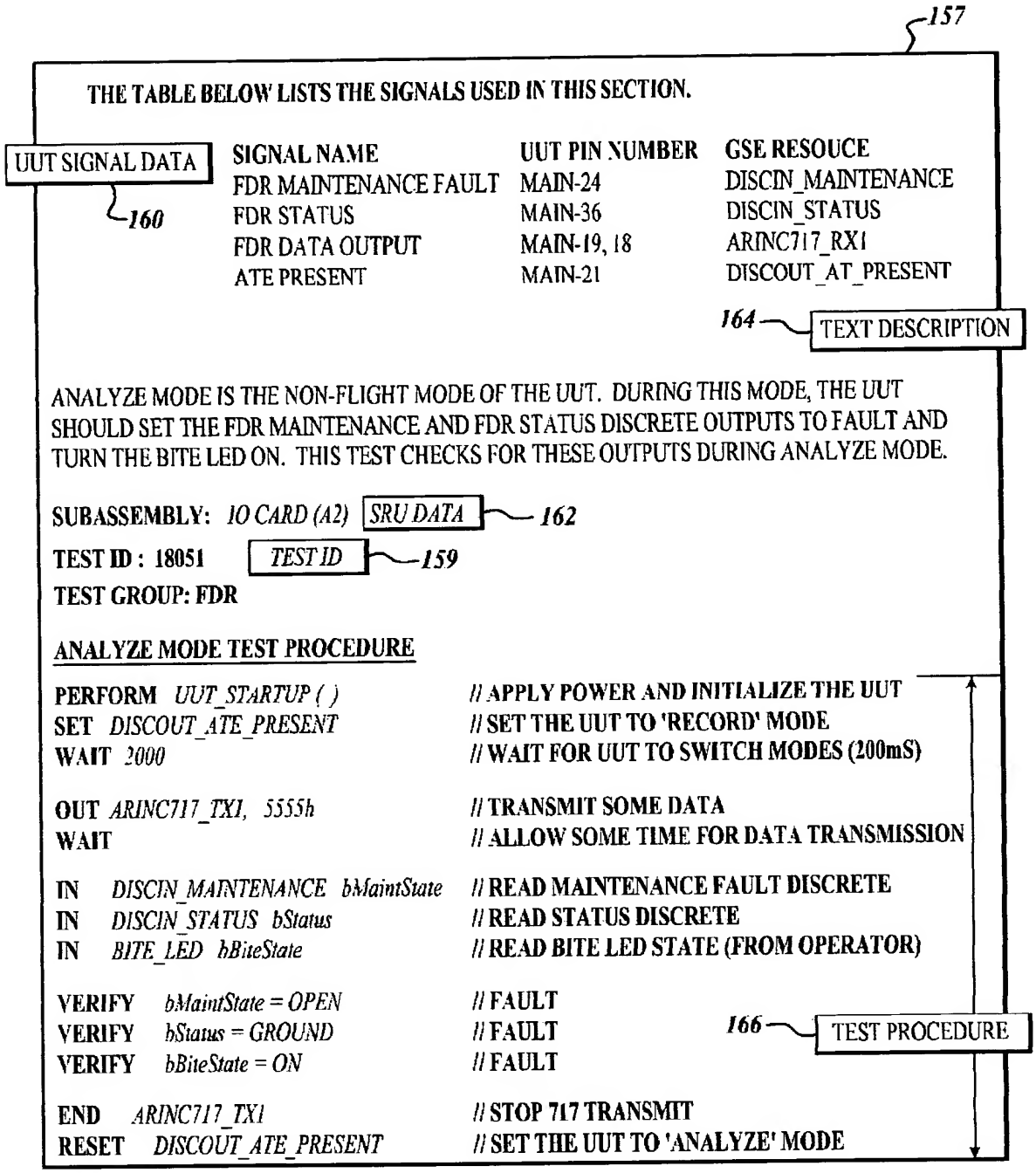

157
THE TABLE BELOW LISTS THE SIGNALS USED IN THIS SECTION.
UUT SIGNAL DATA
160
SIGNAL NAME | UUT PIN NUMBER | GSE RESOUCE
FDR MAINTENANCE FAULT | MAIN-24 | DISCIN_MAINTENANCE
FDR STATUS | MAIN-36 | DISCIN_STATUS
FDR DATA OUTPUT | MAIN-19, 18 | ARINC717_RX1
ATE PRESENT | MAIN-21 | DISCOUT_AT_PRESENT
164
TEXT DESCRIPTION
ANALYZE MODE IS THE NON-FLIGHT MODE OF THE UUT. DURING THIS MODE, THE UUT SHOULD SET THE FDR MAINTENANCE AND FDR STATUS DISCRETE OUTPUTS TO FAULT AND TURN THE BITE LED ON. THIS TEST CHECKS FOR THESE OUTPUTS DURING ANALYZE MODE.
SUBASSEMBLY: IO CARD (A2)
SRU DATA
162
TEST ID : 18051
TEST ID
159
TEST GROUP: FDR
ANALYZE MODE TEST PROCEDURE
PERFORM UUT_STARTUP ( ) // APPLY POWER AND INITIALIZE THE UUT
SET DISCOUT_ATE_PRESENT // SET THE UUT TO 'RECORD' MODE
WAIT 2000 // WAIT FOR UUT TO SWITCH MODES (200mS)
OUT ARINC717_TX1, 5555h // TRANSMIT SOME DATA
WAIT // ALLOW SOME TIME FOR DATA TRANSMISSION
IN DISCIN_MAINTENANCE bMaintState // READ MAINTENANCE FAULT DISCRETE
IN DISCIN_STATUS bStatus // READ STATUS DISCRETE
IN BITE_LED bBiteState // READ BITE LED STATE (FROM OPERATOR)
VERIFY bMaintState = OPEN // FAULT
VERIFY bStatus = GROUND // FAULT
VERIFY bBiteState = ON // FAULT
166
TEST PROCEDURE
END ARINC717_TX1 // STOP 717 TRANSMIT
RESET DISCOUT_ATE_PRESENT // SET THE UUT TO 'ANALYZE' MODE

Fig. 7.

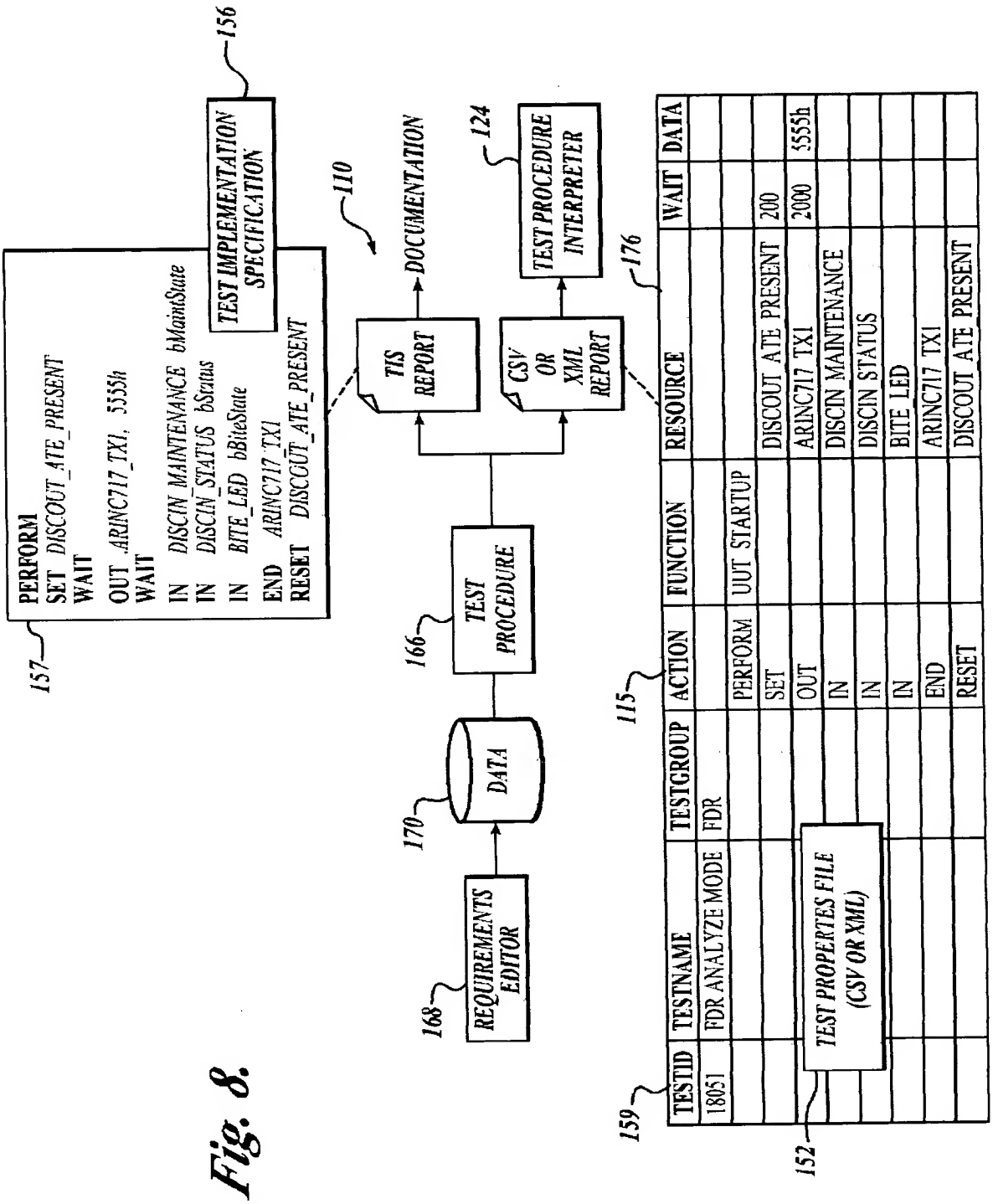

PERFORM
SET DISCOUT_ATE_PRESENT
WAIT
OUT ARINC717_TX1, 5555h
WAIT
IN DISCIN_MAINTENANCE bMaintState
IN DISCIN_STATUS bStatus
IN BITE_LED bBiteState
END ARINC717_TX1
RESET DISCOUT_ATE_PRESENT
157
156
TEST IMPLEMENTATION SPECIFICATION
110
TIS REPORT
DOCUMENTATION
124
TEST PROCEDURE INTERPRETER
CSV OR XML REPORT
176
166
TEST PROCEDURE
170
DATA
168
REQUIREMENTS EDITOR
115
159
152
TEST PROPERTIES FILE (CSV OR XML)
TESTID
TESTNAME
TESTGROUP
ACTION
FUNCTION
RESOURCE
WAIT
DATA
18051
FDR ANALYZE MODE
FDR
PERFORM
UUT STARTUP
SET
DISCOUT ATE PRESENT
200
OUT
ARINC717 TX1
2000
5555h
IN
DISCIN MAINTENANCE
IN
DISCIN STATUS
IN
BITE LED
END
ARINC717 TX1
RESET
DISCOUT ATE PRESENT

Fig. 8.

166

```
ANALYZE MODE TEST PROCEDURE

PERFORM                                  // APPLY POWER AND INITIALIZE THE UUT
SET  DISCOUT_ATE_PRESENT                 // SET THE UUT TO 'RECORD' MODE
WAIT                                     // WAIT FOR UUT TO SWITCH MODES (200mS)

OUT  ARINC717_TX1,  5555h                // TRANSMIT SOME DATA
WAIT                                     // ALLOW SOME TIME FOR DATA TRANSMISSION

IN   DISCIN_MAINTENANCE  bMaintState     // READ MAINTENANCE FAULT DISCRETE
IN   DISCIN_STATUS  bStatus              // READ STATUS DISCRETE
IN   BITE_LED  bBiteState                // READ BITE LED STATE
VERIFY  bMaintState = OPEN               // FAULT
VERIFY  bStatus = GROUND                 // FAULT
VERIFY  bBiteState = ON                  // FAULT

END  ARINC717_TX1                        // STOP 717 TRANSMIT
RESET  DISCOUT_ATE_PRESENT               // SET THE UUT TO 'ANALYZE' MODE
```

Fig. 9.

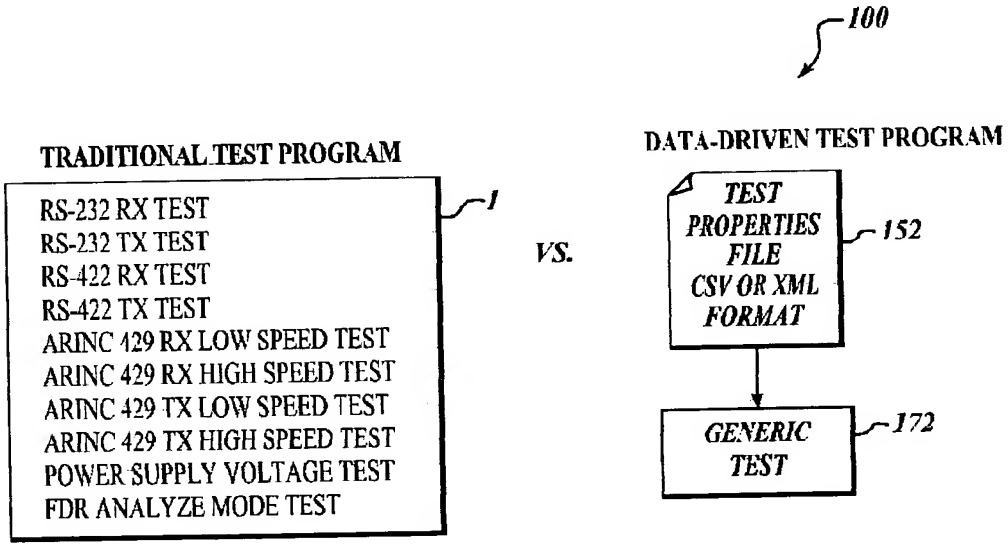


Fig. 10.

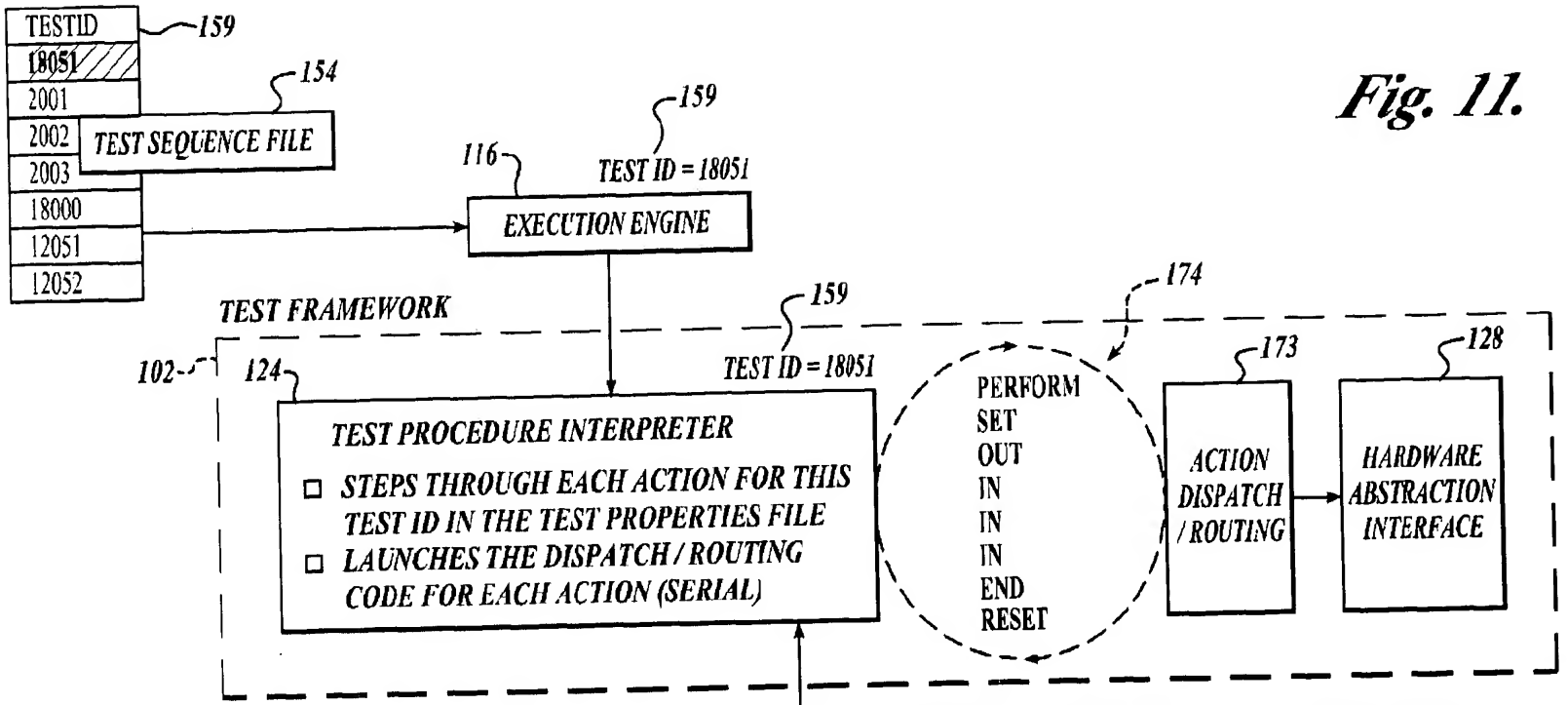


Fig. 11.

TESTID	TESTNAME	TESTGROUP	ACTION	FUNCTION	RESOURCE	WAIT	DATA
18051	FDR ANALYZE MODE	FDR					
			PERFORM	UUT_STARTUP			
			SET		DISCOUT_ATE_PRESENT	200	
			OUT		ARINC717_TX1	2000	5555h
			IN		DISCIN MAINTENANCE		
			IN		DISCIN STATUS		
			IN		BITE LED		
			END		ARINC717_TX1		
			RESET		DISCOUT_ATE_PRESENT		

152 TEST PROPERTIES FILE

9/16

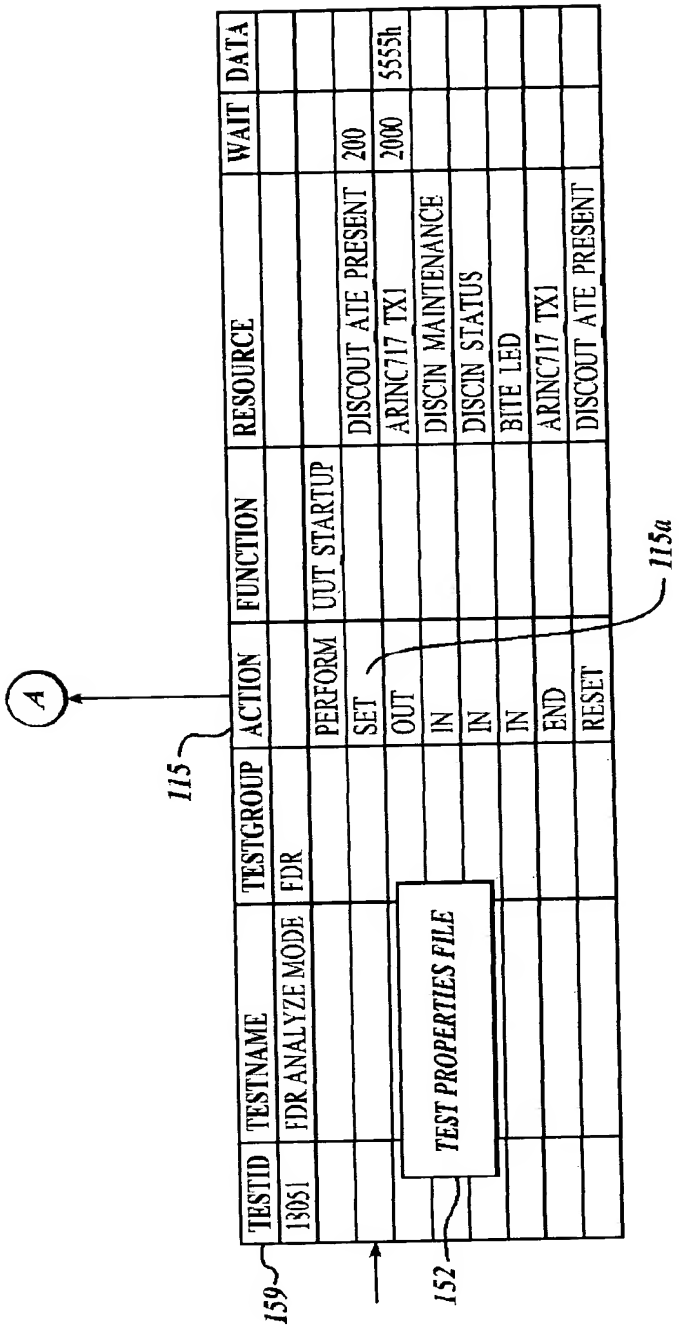

A
115
115a
159
152
TEST PROPERTIES FILE
TESTID
TESTNAME
TESTGROUP
ACTION
FUNCTION
RESOURCE
WAIT
DATA
13051
FDR ANALYZE MODE
FDR
PERFORM
UUT STARTUP
DISCOUT ATE PRESENT
200
SET
ARINC717 TX1
2000
5555h
OUT
DISCIN MAINTENANCE
IN
DISCIN STATUS
IN
BITE LED
IN
ARINC717 TX1
END
DISCOUT ATE PRESENT
RESET

Fig. 12A.

TEST PROCEDURE STEPS:

SET DISCOUT_ATE_PRESENT
WAIT 200

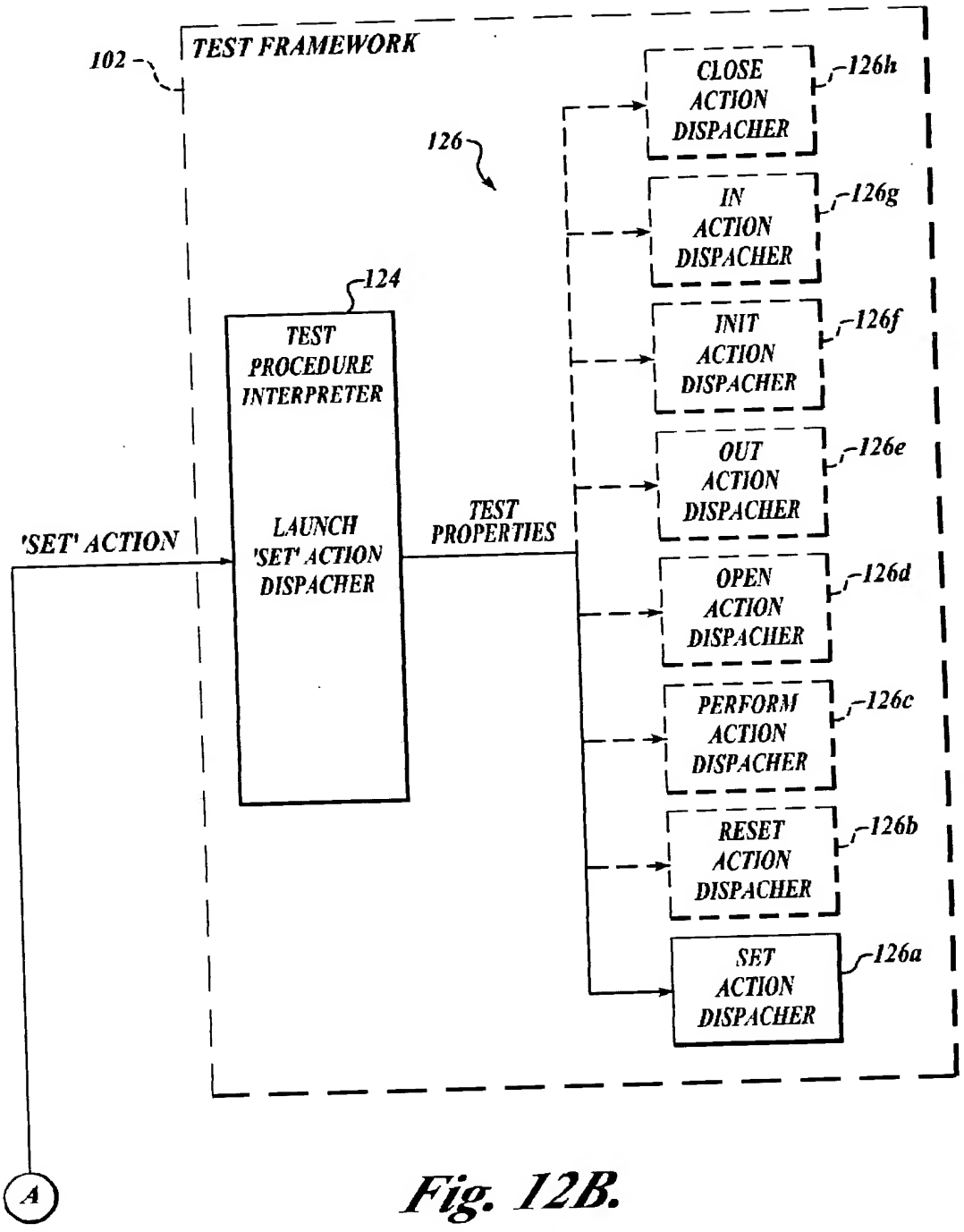
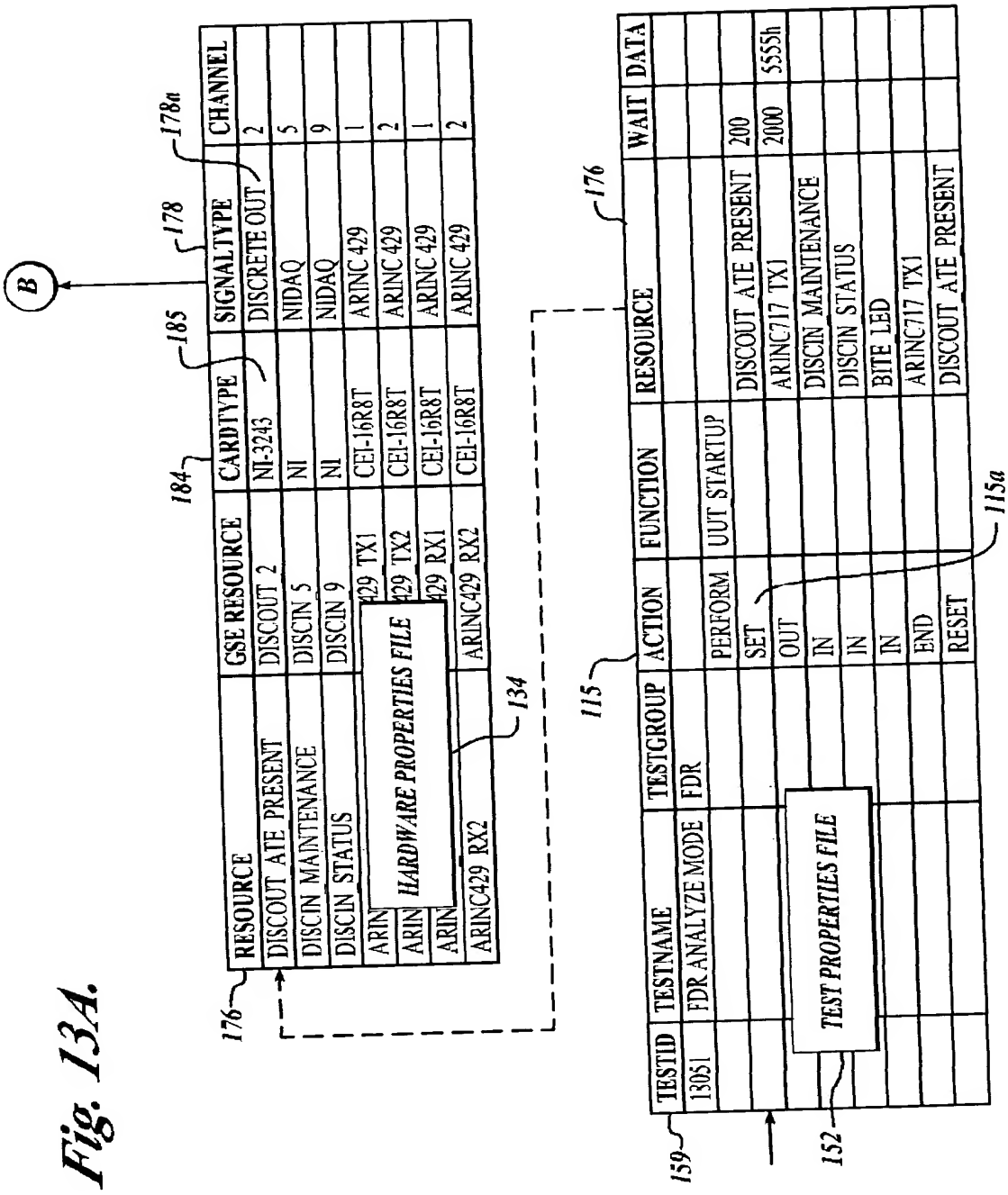


Fig. 12B.

Fig. 13A.


B
178
178a
185
184
176
RESOURCE
GSE RESOURCE
CARDTYPE
SIGNALTYPE
CHANNEL
DISCOUT ATE PRESENT
DISCOUT 2
NI-3243
DISCRETE OUT
2
DISCIN MAINTENANCE
DISCIN 5
NI
NIDAQ
5
DISCIN STATUS
DISCIN 9
NI
NIDAQ
9
ARIN429 TX1
CEI-16R8T
ARINC 429
1
ARIN429 TX2
CEI-16R8T
ARINC 429
2
ARIN429 RX1
CEI-16R8T
ARINC 429
1
ARINC429 RX2
CEI-16R8T
ARINC 429
2
HARDWARE PROPERTIES FILE
134
115
176
115a
TESTID
TESTNAME
TESTGROUP
ACTION
FUNCTION
RESOURCE
WAIT
DATA
13051
FDR ANALYZE MODE
FDR
PERFORM
UUT STARTUP
DISCOUT ATE PRESENT
200
SET
OUT
ARINC717 TX1
2000
5555h
IN
DISCIN MAINTENANCE
IN
DISCIN STATUS
IN
BITE LED
END
ARINC717 TX1
RESET
DISCOUT ATE PRESENT
TEST PROPERTIES FILE
159
152

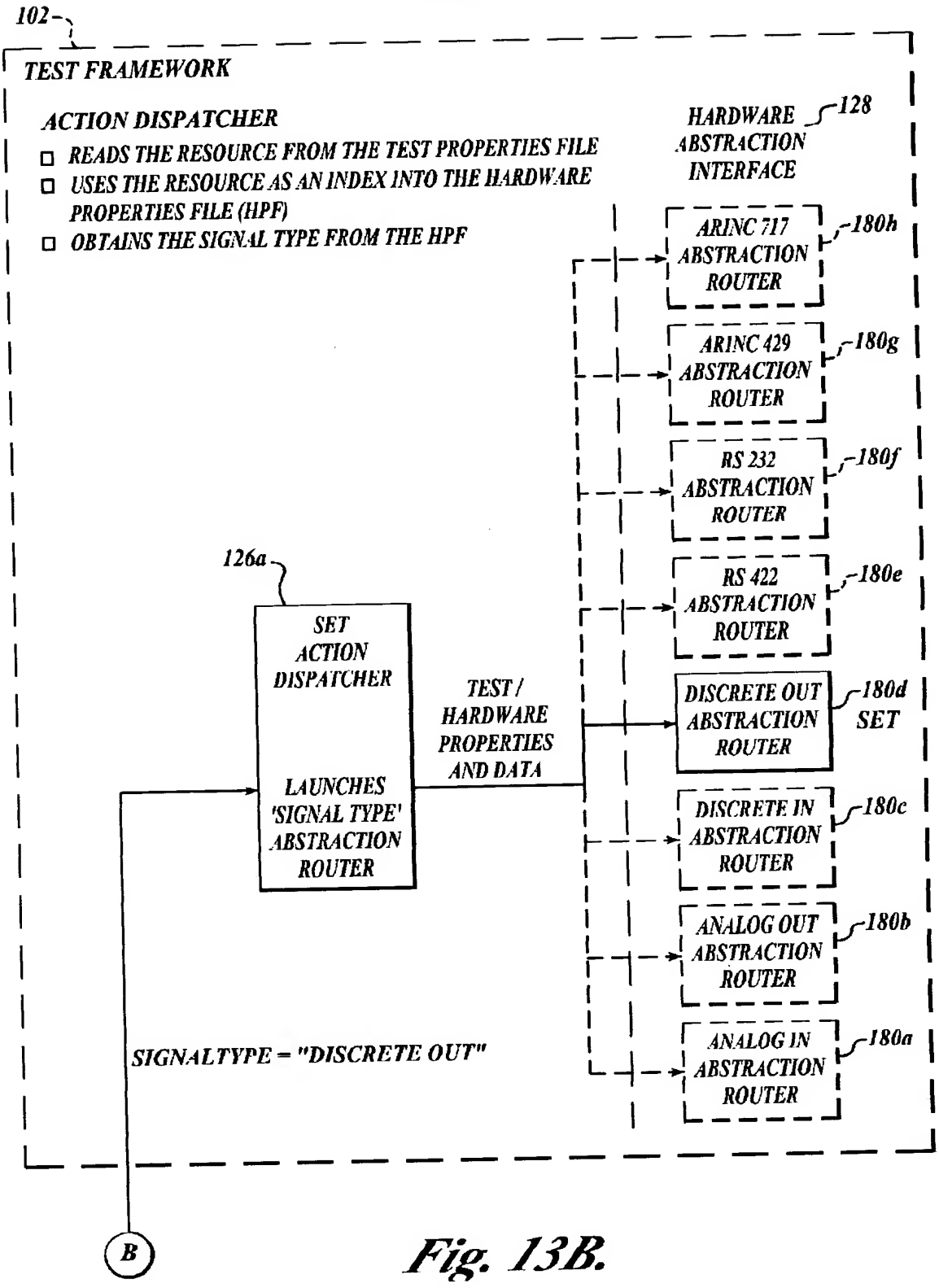

102
TEST FRAMEWORK
ACTION DISPATCHER
READS THE RESOURCE FROM THE TEST PROPERTIES FILE
USES THE RESOURCE AS AN INDEX INTO THE HARDWARE PROPERTIES FILE (HPF)
OBTAINS THE SIGNAL TYPE FROM THE HPF
HARDWARE ABSTRACTION INTERFACE
128
ARINC 717 ABSTRACTION ROUTER
180h
ARINC 429 ABSTRACTION ROUTER
180g
RS 232 ABSTRACTION ROUTER
180f
RS 422 ABSTRACTION ROUTER
180e
DISCRETE OUT ABSTRACTION ROUTER
180d
SET
DISCRETE IN ABSTRACTION ROUTER
180c
ANALOG OUT ABSTRACTION ROUTER
180b
ANALOG IN ABSTRACTION ROUTER
180a
126a
SET ACTION DISPATCHER
LAUNCHES 'SIGNAL TYPE' ABSTRACTION ROUTER
TEST / HARDWARE PROPERTIES AND DATA
SIGNALTYPE = "DISCRETE OUT"
B

Fig. 13B.

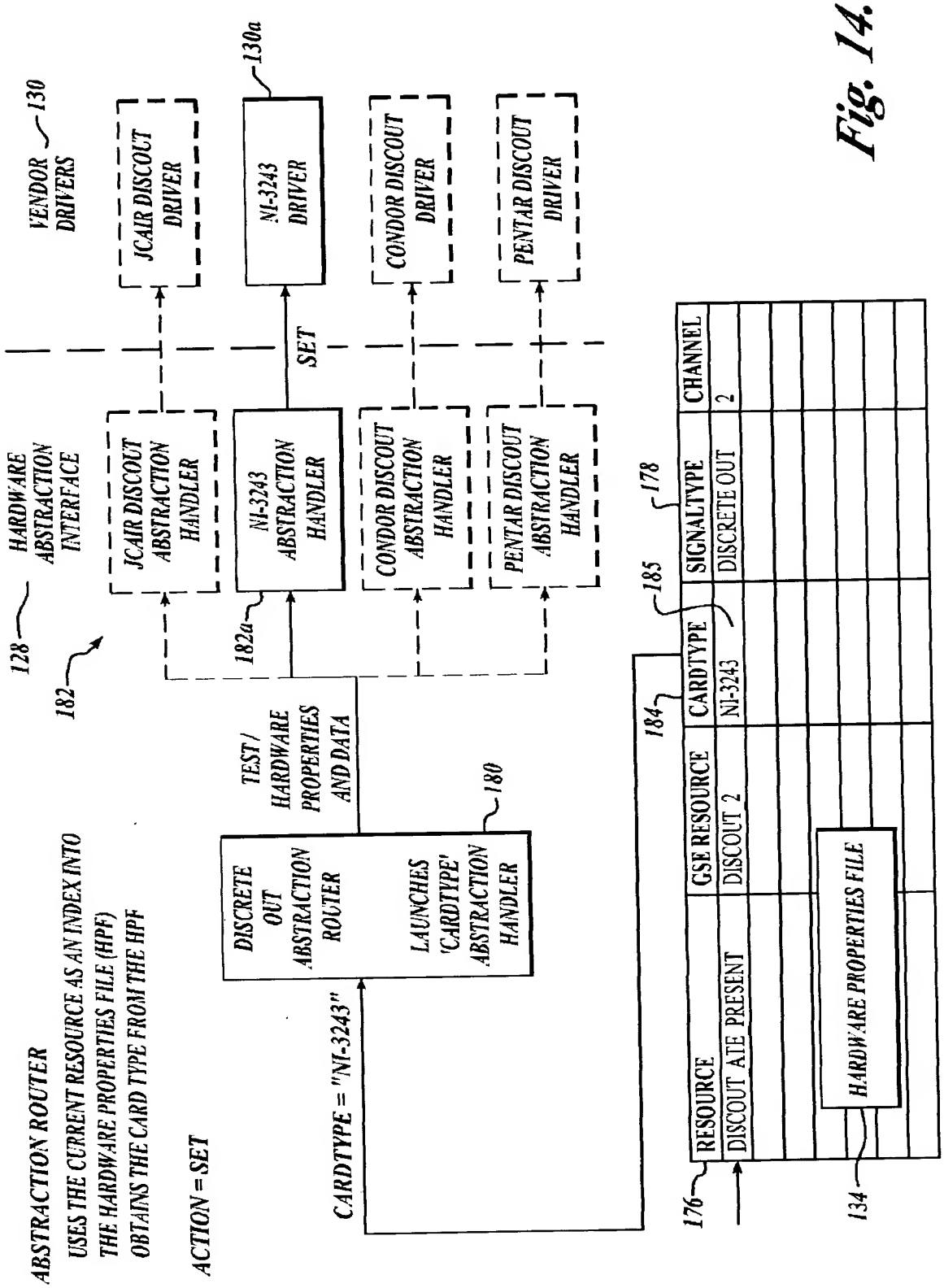

ABSTRACTION ROUTER
USES THE CURRENT RESOURCE AS AN INDEX INTO THE HARDWARE PROPERTIES FILE (HPF)
OBTAINS THE CARD TYPE FROM THE HPF
ACTION = SET
CARDTYPE = "NI-3243"
DISCRETE OUT ABSTRACTION ROUTER
LAUNCHES 'CARDTYPE' ABSTRACTION HANDLER
180
TEST / HARDWARE PROPERTIES AND DATA
182
182a
128
HARDWARE ABSTRACTION INTERFACE
JCAIR DISCOUT ABSTRACTION HANDLER
NI-3243 ABSTRACTION HANDLER
CONDOR DISCOUT ABSTRACTION HANDLER
PENTAR DISCOUT ABSTRACTION HANDLER
SET
VENDOR DRIVERS
130
JCAIR DISCOUT DRIVER
NI-3243 DRIVER
130a
CONDOR DISCOUT DRIVER
PENTAR DISCOUT DRIVER
184
185
178
RESOURCE
DISCOUT ATE PRESENT
GSE RESOURCE
DISCOUT 2
CARDTYPE
NI-3243
SIGNALTYPE
DISCRETE OUT
CHANNEL
2
176
134
HARDWARE PROPERTIES FILE

Fig. 14.

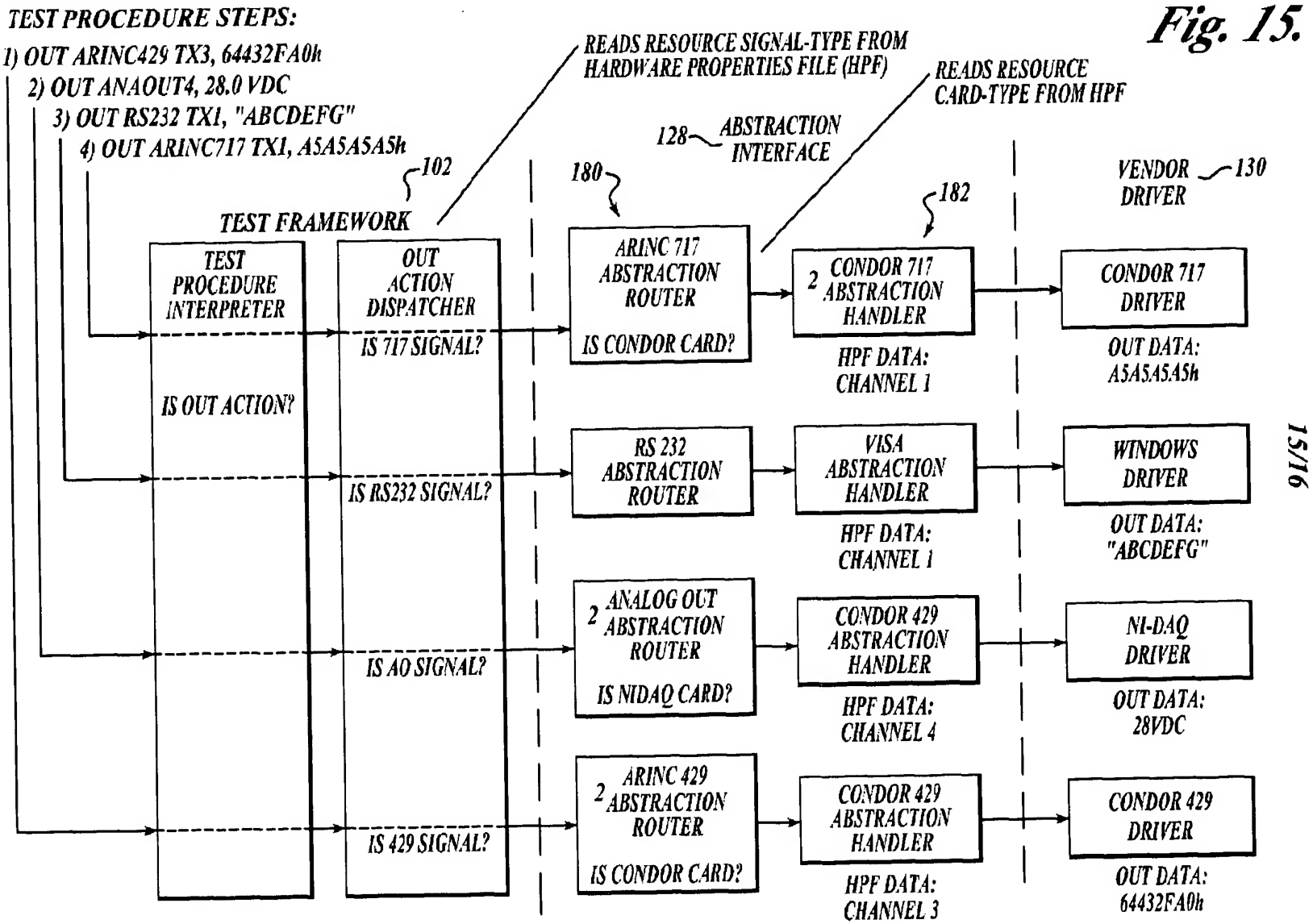

TEST PROCEDURE STEPS:
1) OUT ARINC429 TX3, 64432FA0h
2) OUT ANAOUT4, 28.0 VDC
3) OUT RS232 TX1, "ABCDEFG"
4) OUT ARINC717 TX1, A5A5A5A5h
READS RESOURCE SIGNAL-TYPE FROM HARDWARE PROPERTIES FILE (HPF)
READS RESOURCE CARD-TYPE FROM HPF
128 ABSTRACTION INTERFACE
102
180
182
VENDOR DRIVER 130
TEST FRAMEWORK
TEST PROCEDURE INTERPRETER
OUT ACTION DISPATCHER
ARINC 717 ABSTRACTION ROUTER
2 CONDOR 717 ABSTRACTION HANDLER
CONDOR 717 DRIVER
IS OUT ACTION?
IS 717 SIGNAL?
IS CONDOR CARD?
HPF DATA: CHANNEL 1
OUT DATA: A5A5A5A5h
RS 232 ABSTRACTION ROUTER
VISA ABSTRACTION HANDLER
WINDOWS DRIVER
IS RS232 SIGNAL?
HPF DATA: CHANNEL 1
OUT DATA: "ABCDEFG"
2 ANALOG OUT ABSTRACTION ROUTER
CONDOR 429 ABSTRACTION HANDLER
NI-DAQ DRIVER
IS AO SIGNAL?
IS NIDAQ CARD?
HPF DATA: CHANNEL 4
OUT DATA: 28VDC
2 ARINC 429 ABSTRACTION ROUTER
CONDOR 429 ABSTRACTION HANDLER
CONDOR 429 DRIVER
IS 429 SIGNAL?
IS CONDOR CARD?
HPF DATA: CHANNEL 3
OUT DATA: 64432FA0h

Fig. 15.

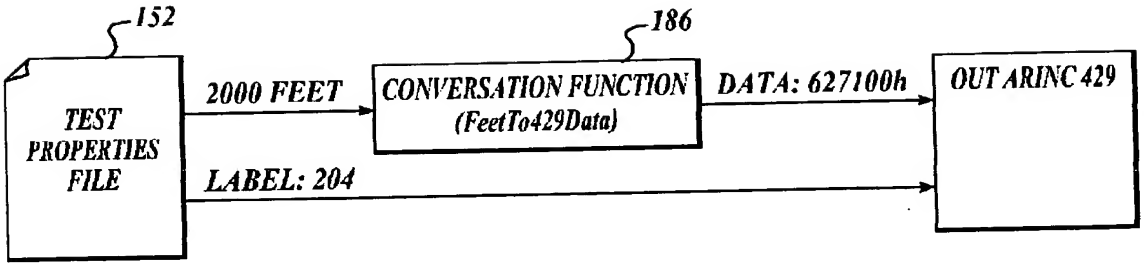

152
186
TEST PROPERTIES FILE
2000 FEET
CONVERSATION FUNCTION
(FeetTo429Data)
DATA: 627100h
OUT ARINC 429
LABEL: 204

Fig. 16.